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the sanitary evils of construction. We have known of school rooms heated by the "indirect method" in which the winter air containing but a few grains of moisture to the cubic foot is warmed by passing over steam coils and then delivered to the school room, whose windows are closed by edict, its relative humidity so lowered that the moisture must be actually sucked from the skins and mucous membranes of the defenceless children. This air is chemically pure but physiologically like salt to a raw surface.

The little book under consideration is excellent in the orderly presentation of the various phases of the subject and too much praise can not be given for its profuseness of illustration, one hundred and fifty cuts being devoted to this purpose. The average mind derives a clearer idea of architectural design from a simple figure than from pages of labored description. It is to be hoped that in preparing another edition the author will carefully review his text with the purpose of removing all obscurity. Thus, the legend to Fig. 1, p. 22, reads "When the upper window sash is let down and the shade lowered, a larger amount of fresh air may be obtained by inserting a strip of open mesh netting between the shade and the roller." This is perfectly clear when the mechanism is understood, but it requires an undue mental effort to grasp its meaning. The author was happy in his section devoted to the use of clothing and he might profitably have discussed somewhat more in detail the physiological relations of textures—as, for example, the relative properties of silk, linen-mesh and woolen underwear. One of the most valuable chapters of the book is that which exploits the advantages of the house roof to the seeker after fresh air. It is worth enquiring whether it would not be well to devise a mirror situated so as to reflect the scenes of the street to relieve the monotony of "sitting out."

In the section devoted to the clothes-closet, it would have been well had the author insisted that garments, before being stored away, should be hung in the open air, in sunlight if possible, *with the pockets turned inside out.*

Few things are more difficult than to present a "nature study" which shall be scientifically true while forensically convincing to the lay mind. The practical essentials of fresh-air teaching have been excellently presented in this volume, but we are all too much interested in the subject to tolerate the smallest gnat in the ointment. Modern research suggests that the open air calls upon the autonomic systems of the body for somewhat the same kind of response that physical exercise demands of the skeletal nerves and muscles. We know definitely that in the treatment of tuberculosis, for example, exercise may be healing or deadly according to the state of the patient. The truth may very well be that a prescription of "fresh air" is not so simple, but must in scientific therapeutics be analyzed into its physical components of barometric pressure, motion, humidity, temperature, illumination and electric tension and to all these there must be added the one constant excipient—elixir of joy.

HENRY SEWALL

SCIENTIFIC JOURNALS AND ARTICLES

THE March number (volume 19, number 6) of the *Bulletin of the American Mathematical Society* contains the following papers: Report of the nineteenth annual meeting of the society, by F. N. Cole; "The product of two or more groups," by G. A. Miller; "The mathematics of Mahāvīrācārya," by D. E. Smith; "Shorter notices:" Townsend and Goodenough's First Course in Calculus and Essentials of Calculus, by N. J. Lennes; Dziobek's Differential- und Integral-Rechnung and Hack's Wahrscheinlichkeitsrechnung, by G. W. Myers; Brill's Relativitätsprinzip, Föppl's Technische Mechanik, Volume I., and Orlich's Theorie der Wechselströme, by E. B. Wilson; "Notes"; and "New Publications."

THE April number of the *Bulletin* contains: "Some general aspects of modern geometry," by E. J. Wilczynski; "On certain non-linear integral equations," by H. Galajikian; "A theorem on asymptotic series," by V. C. Poor; "On Poincaré's correction to Bruns' theo-

rem," by W. D. MacMillan; "Note on the groups for triple-systems," by L. D. Cummings; review of De Séguier's *Théorie des Groupes de Substitutions*, by G. A. Miller; review of Wilson's *Advanced Calculus*, by W. E. Byerly; review of Prasad's *Differential and Integral Calculus*, by E. B. Wilson; "Shorter notices"; Tannery's *Mémoires scientifiques*, Volume I., by D. E. Smith; Natorp's *Logische Grundlagen der exakten Wissenschaften*, Grelling-Enriques' *Probleme der Wissenschaft*, and Volkmann's *Erkenntnistheoretische Grundzüge der Naturwissenschaften*, by J. W. Young; Pascal's *Repertorium der höheren Mathematik*, second edition, by C. H. Sisam; Love's *Differential and integral calculus*, by Arnold Dresden; "Notes"; and "New Publications."

THE INFLUENCE OF VARIOUS EDUCATIONAL INSTITUTIONS UPON THE DEVELOPMENT OF AGRICULTURAL SCIENCE

EDUCATION in the general field of agricultural science is coming to occupy so large a place in primary, secondary and collegiate instruction, that the development of this field is of almost universal interest among educational workers. Both the subject matter and the pedagogical methods of agricultural science are so new as to be practically the creation of the present generation of research students and educators. It was of interest to the writer, therefore, to ascertain, as fairly as circumstances would permit, the sources for the inspiration and conception of the men who are building up this new science. It occurred to me to ascertain at what institutions of learning the men who were shaping the thought in this field secured their scholastic training, both undergraduate and postgraduate. Each of the leading educational institutions of the world is generally recognized as standing for a certain type of instruction or conception of educational methods. It seemed to be of interest to determine to what proportionate extent the ideals of each such institution are influencing the development of agricultural science.

For this purpose, a study was made of the number of degrees (exclusive of honorary degrees) granted by each institution to persons who are, or who have been during the past five years, members of the Society for the Promotion of Agricultural Science. This society does not, of course, include every person who is actively engaged in this field of work. But its membership does include a very large proportion of the leaders of this movement in America, and is probably closely representative of the scholastic training which such leadership has received.

DEGREES GRANTED BY VARIOUS INSTITUTIONS TO
MEMBERS OF THE SOCIETY FOR PROMOTION
OF AGRICULTURAL SCIENCE

| | Bachelors | Masters | Doctors |
|------------------------------------|-----------|---------|---------|
| Michigan Agricultural College..... | 21 | 15 | 2 |
| Cornell..... | 9 | 9 | 7 |
| Iowa State College..... | 9 | 9 | 0 |
| Harvard..... | 4 | 4 | 5 |
| University of Wisconsin..... | 3 | 3 | 4 |
| Mass. Agricultural College..... | 9 | 1 | 0 |
| University of Missouri..... | 5 | 2 | 2 |
| University of Michigan..... | 4 | 2 | 3 |
| Miss. Agricultural College..... | 5 | 3 | 0 |
| University of Illinois..... | 4 | 2 | 1 |
| University of Nebraska..... | 4 | 3 | 0 |
| Purdue..... | 5 | 2 | 0 |
| Yale..... | 3 | 2 | 2 |
| University of Maine..... | 4 | 1 | 1 |
| University of Ohio..... | 4 | 0 | 1 |
| Rutgers College..... | 3 | 2 | 0 |
| Johns Hopkins..... | 1 | 0 | 3 |
| Kansas Agricultural College..... | 2 | 2 | 0 |
| Colorado Agricultural College.. | 2 | 2 | 0 |
| So. Dakota Agricultural College. | 3 | 1 | 0 |
| University of Washington..... | 2 | 2 | 0 |
| European universities..... | 2 | 0 | 12 |

The proportionate distribution of the degrees received by these men among the several institutions does not necessarily indicate the relative esteem in which these institutions are now held by men of agricultural science as schools for training in this field. It is probably a more accurate measure of the opportunities which were available at the time when these men were seeking their scholastic training. Again, the present standards and ideals of these institutions may be quite different, with many of these men now on their facul-